CBCS SCHEME

USN | | | | | | | | | | | |

15EC834

Eighth Semester B.E. Degree Examination, Feb./Mar. 2022
Machine Learning

Time: 3 hrs.

Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1   a. Explain various steps involved in designing a learning system.   **(08 Marks)**
    b. List issues in Machine learning.   **(05 Marks)**
    c. Describe the following problem with respect to task, performance and experience Hand written recognition problem.   **(03 Marks)**

OR

2   a. Write Find – S algorithm. Apply the algorithm for the following training example.

Form	Color	Size	Class
Circle	red	small	+
Circle	red	big	+
Triangle	yellow	small	–
Circle	yellow	small	–
Triangle	red	Big	–
Circle	yellow	big	–

      (08 Marks)

    b. Describe candidate elimination algorithm.   **(08 Marks)**

Module-2

3   a. Describe the ID3 algorithm with the help of an example.   **(08 Marks)**
    b. Discuss the two approaches to prevent over fitting of the data.   **(08 Marks)**

OR

4   a. Discuss two popular weight update rules in Artificial neural networks.
        i)   Perceptron rule
        ii) Delta rule.   **(08 Marks)**
    b. How a single perceptron can be used to represent the Boolean functions such as AND and OR.   **(08 Marks)**

Module-3

5   a. Briefly describe the Baye's theorem.   **(04 Marks)**
    b. Explain hMAP Learning algorithm (maximum a posterior hypothesis)   **(04 Marks)**
    c. A patient takes a lab test and the result comes positive the test returns a correct positive result in only 98% of the cases in which the disease is actually present, and a correct negative result in only 97% of the cases in which the disease is not present. Furthermore 0.008 of the entire population have this cancer. What is the maximum a posteriori hypothesis for a patient who tests positive?   **(08 Marks)**

OR

6 a. Explain briefly Naïve Bayes classifier and Gibbs algorithm/classifier. (08 Marks)
   b. The following table gives data set about stolen vehicles. Using bayes classifier classify the new data (Red, SUV, domestic)

Example No	Color	Type	Origin	Stolen
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	Sports	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Domestic	No
9	Red	SUV	Imported	No
10	Red	Sports	Imported	Yes

(08 Marks)

Module-4

7 a. Explain K-nearest neighbor algorithm. (05 Marks)
   b. Explain locally weighted Regression. (05 Marks)
   c. Explain case based Reasoning with an example. (06 Marks)

OR

8 a. Explain briefly radial basis functions. (04 Marks)
   b. What is Instant based learning? (04 Marks)
   c. Explain FOIL algorithm. (08 Marks)

Module-5

9 a. What is reinforcement learning and list the reinforcement problem characteristics. (08 Marks)
   b. Explain FOCL algorithm with an example. (08 Marks)

OR

10 a. Write differences between inductive and Analytical learning. (08 Marks)
   b. Explain Q-learning assuming deterministic reward and action with example. (08 Marks)

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